



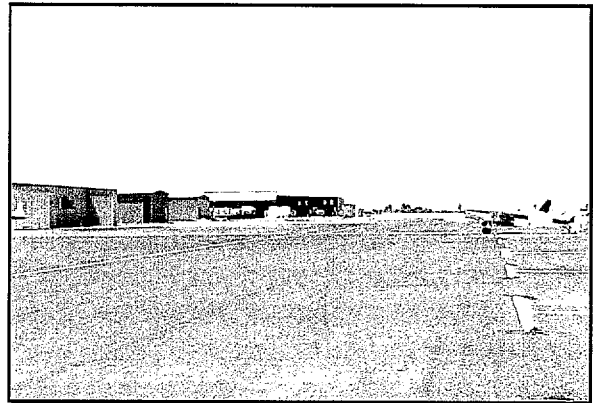
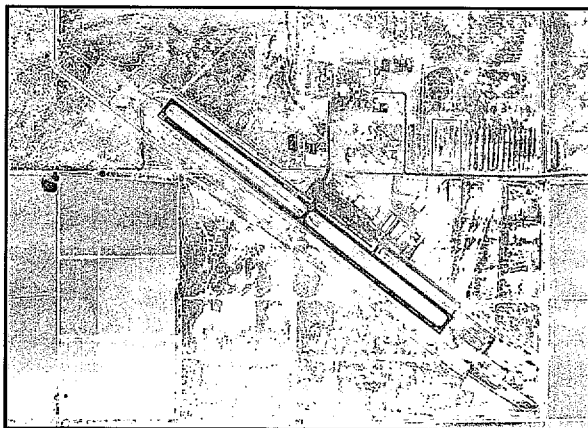
Chapter Four

DEVELOPMENT ALTERNATIVES

DEVELOPMENT ALTERNATIVES

The first three chapters of the master plan have presented the existing airport conditions, forecasts of aviation demand through the year 2020, and an evaluation of future facility needs. The purpose of this chapter is to identify alternatives available to meet those needs or items which need to be taken into consideration prior to presenting a finalized master plan concept. Once the finalized master plan concept has been identified, cost estimates will be prepared for the individual projects, a development schedule will be prepared, and potential funding sources for recommended projects will be identified (including those projects that are eligible for federal or state funding assistance).

The possible combination of alternatives can be endless, so some intuitive judgement must be applied to identify those alternatives which have the



greatest potential for implementation. The alternatives analysis is an important step in the planning process since it provides the underlying rationale for the final master plan recommendations.

Three basic conceptual alternatives can be considered. The first involves the transfer of projected aviation demand to other regional airports, or possibly to a new airport site. The second is a "no development" or "do nothing" alternative where the existing airport is left as is. The third alternative involves a development program for the airport within the physical and environmental constraints that are currently present. The alternative concepts presented in this chapter are provided for the purpose of reviewing the relative merits of each as well as the impacts of the implementation of each alternative on the existing airport facilities, environs, and community.

TRANSFER OF AVIATION SERVICES

The alternative of shifting aviation services to another existing airport was found an undesirable alternative due to the number of businesses located on or adjacent to the airport and the substantial activity generated by these users, namely Skydive Arizona, Ag-Aero, Al-Don Dusting, and Arizona Aeropainting. These users have made a considerable investment in facilities located adjacent to the airport, making it difficult for them to relocate to another airport. In 1996, the airport had 22 based aircraft. Approximately eighteen additional aircraft, located off of airport property, used the airport on a regular basis. Annual operations totaled 52,000. Transferring these aircraft and operations to another airport could not be accomplished without major improvements and substantial costs.

Other airports in central Pinal County which could absorb aviation activity from Eloy Municipal Airport include Casa Grande Municipal Airport and Coolidge Municipal Airport, which are a considerable distance from the City of Eloy, and therefore, would not be in a good position to serve the City. With this in mind, Eloy Municipal Airport is in the best position to serve the long-range aviation needs of the City.

The continuing growth expected by the major employers in the area as well as the infusion of new industries into the community demonstrates the need for a highly functional airport. General aviation airports play a major role in the way companies conduct their business. Eloy Municipal Airport can be expected

to accommodate business aircraft for companies locating to, or conducting business in, the City of Eloy. This role is not easily replaced by another existing airport in central Pinal County without tremendous expense, and disruption.

CONSTRUCTION OF A NEW AIRPORT SITE

The alternative of developing an entirely new airport facility to meet the aviation needs of the City of Eloy was also considered. This was found to be a less feasible alternative, primarily due to economic and environmental concerns. Land acquisition, site preparation, and the construction of an entirely new airport can be a very difficult and costly action. In a situation where public funds are limited, the replacement of a functional airport facility would represent an unjustifiable loss of a significant public investment. From social, political, and environmental standpoints, the commitment of a new large land area must be considered. The public sentiment toward new airports in the last few years has been very negative, primarily because a new airport normally requires the acquisition of several large parcels of privately-owned land. Furthermore, the development of a new airport similar to the existing Eloy Municipal Airport would likely take ten years to become a reality. In addition, the potential exists for significant environmental impacts associated with disturbing a large land area when developing a new airport site. Adding a new airport when the existing airport can be improved for much less cost cannot be considered a prudent alternative.

DO-NOTHING ALTERNATIVE

In analyzing and comparing the costs and benefits of various development alternatives, it is important to consider the consequence of no future development at Eloy Municipal Airport. The "do-nothing" alternative essentially considers keeping the airport in its present condition and not providing for any type of improvement to the existing facilities. The primary result of this alternative would be the inability of the airport to satisfy the projected aviation demands of the airport service area.

The unavoidable consequence of the "do-nothing" alternative would involve the airport's inability to attract potential airport users. Corporate aviation plays a major role in the transportation of business leaders. Thus, an airport's facilities are often the first impression many corporate officials will have of the community. If the airport does not have the capability to meet hangar, apron, or airfield needs of potential users, the City's capabilities to attract business that rely on air transportation will be diminished.

An overall impact of this alternative will be the inability to attract new users, especially those businesses and industries seeking location with adequate and convenient aviation facilities. Eloy Municipal Airport has much to offer in terms of airfield and landside facilities. Without regular maintenance and additional improvements, potential users and business for the City of Eloy could be lost. To

propose no further development at the airport would be inconsistent with current city planning to attract more business and industry to the City of Eloy. Therefore, the "do-nothing" alternative is not considered prudent or feasible.

Overall, transferring service to an existing airport in the region or to an entirely new facility are unreasonable and should not be pursued. With continual improvement, Eloy Municipal Airport is fully capable of accommodating the long-term aviation demands of the City of Eloy and should be developed in response to those demands. The airport has the potential to continue to develop as a quality general aviation airport that could greatly enhance the economic development of the community.

PREVIOUS MASTER PLAN

The previous airport master plan was completed in 1988. Similar to the initial findings in this master plan, the 1988 master plan included recommendations for an 800-foot extension of the runway and parallel taxiway, additional exit taxiways between each runway end and the midfield taxiway, the installation of a visual glideslope indicator (VGSI) at each runway end, and additional T-hangar and corporate (conventional) hangar development. The 1988 master plan recommended the purchase of 2.0 acres of land adjacent to the south portion of the apron area for an expansion of the T-hangars buildings and for conventional hangar development along a taxiway extending from the apron.

Since the early 1990's, much of the growth at the airport has been the result of the expansion of activities related to Skydive Arizona and the agricultural operators, Ag-Aero and Al-Don Dusting. While these activities have increased the use of the airfield, they have not created an increased demand for additional landside facilities at the airport as these companies are located off of airport property.

An Environmental Assessment completed in 1991 examined the environmental impacts of an extension of Runway 2-20 to the northeast. The report revealed that an archeological site exists to the northeast and could be potentially impacted by an 800-foot extension of the runway to the northeast. The Environmental Assessment suggested that data collection at the archeological site could mitigate this impact.

AIRPORT DEVELOPMENT ALTERNATIVES

The previous chapter identified both the airside and landside facilities necessary to satisfy forecast demands through the planning period. The overall objective is to produce a balanced airside and landside complex to serve forecast aviation demands. However, before defining and evaluating specific alternatives, development objectives should be identified.

The City of Eloy provides the overall guidance for the operation and development of the Eloy Municipal Airport. Therefore, it is of primary concern that the airport is marketed, developed, and operated for the

betterment of the City of Eloy. With this in mind, the airport development alternatives have been prepared considering the following objectives:

- Develop an attractive, efficient, and safe aviation facility.
- Encourage increased general aviation use of the airport by promoting increased business and corporate use of the airport.
- Provide areas for commercial general aviation and private general aviation development.

In attempting to meet these objectives, development of facilities should be undertaken to minimize operational constraints. Flexibility in airport development is essential to assure adequate capacity while minimizing financial commitments until market potential is realized.

The development alternatives for Eloy Municipal Airport can be categorized into two functional areas: the airside (airfield) and landside (aircraft storage hangars, apron, and terminal areas.) Within each of these areas, specific facilities are required or desired. Although each functional area is treated separately, planning must integrate the individual requirements so that they complement one another.

AIRFIELD ALTERNATIVES

Airfield facilities are, by nature, the focal point of the airport complex. Because of their primary role and the fact that they physically dominate airport land use,

airfield facility needs are often the most critical factor in the determination of viable airport development alternatives. In particular, the runway system requires the greatest commitment of land area and often imparts the greatest influence on the identification and development of other airport facilities. Furthermore, due to the nature of aircraft operations, there are a number of FAA design criteria that must be considered when looking at airfield improvements. These criteria can often have a significant impact on the viability of various alternatives designed to meet airfield needs. There are two primary planning issues related to the airfield: 1) runway length, and 2) design standards.

Runway Length

As indicated in the facility requirements analysis, the existing runway length of 3,900 feet meets the requirements of most of the aircraft that currently utilize the airport. While certain turboprop aircraft (such as the Super King Air) and smaller business jets (such as the Cessna Citation) can and do use the airport, a runway length of 4,700 feet would be desirable to better serve these users. During warm summer months and at heavier take-off weights, common business jet aircraft runway length requirements can reach 5,500 feet. The alternatives analysis will examine the feasibility of extending Runway 2-20 to 4,700 feet as well as the potential for 5,500 feet.

There are three alternatives for an extension of Runway 2-20: 1) extend the runway to the northeast (Runway 20 end), 2) extend the runway to the

southwest (Runway 2 end), and 3) divide the extension between each end of the runway. As shown in blue on **Exhibit 4A**, an extension of the runway to 4,700 feet can be accomplished on existing airport property with only a portion of the runway protection zone (RPZ) extending beyond the existing airport property line. The acquisition of an aviation easement or property would be needed to protect the RPZ. The acquisition of approximately 13 acres of land would be required to protect the RPZ under Alternatives A and B. The acquisition of approximately 7 acres of land at each runway end (14 acres total) would be required to protect each RPZ under Alternative C.

As shown in magenta on **Exhibit 4A**, a 1,600-foot extension of the runway to 5,500 feet (as shown on Alternatives A and B) would extend beyond existing airport property. The acquisition of approximately 21 acres of land to the northeast and 22 acres of land to the southeast would be required to accommodate the extension and RPZ under Alternatives A and B. A 1,600-foot extension of the runway to the northeast (Alternative A) would cross an existing irrigation canal which is part of the Central Arizona Project canal system. To provide the full 1,600-foot extension to the northeast, this irrigation canal would need to be relocated or possibly even bridged. As shown on Alternative C, the full 1,600-foot extension could be completed on existing airport property, should the extension be divided between each runway end. Under this alternative, the purchase of approximately 21 acres of land would be required to protect the RPZ at each runway end.

An advantage of extending the runway to the northeast (Alternative A) is that the takeoff threshold for Runway 20 is moved farther northeast. This allows aircraft to climb to altitude more quickly, thus reducing aircraft noise to the southwest over Toltec. However, a 1,600-foot extension to the northeast would require the relocation or bridging of a CAP irrigation canal. Additionally, as mentioned previously, an extension to the northeast could possibly impact an archeological site.

Design Standards

As indicated in the facility needs evaluation, the airport currently does not meet all of the airfield design standards as set forth by the FAA for the type of aircraft currently using and expected to use the airport in the future. To safely accommodate these aircraft at the airport, FAA design standards specify a runway width of 75 feet and runway/taxiway separation distance of 240 feet. Currently, the runway is 60 feet wide and the runway/taxiway separation distance is 200 feet. When Runway 2-20 requires reconstruction, it should be rebuilt to the design width of 75 feet.

Exhibit 4B illustrates two alternatives available to increase the runway/taxiway separation distance to 240 feet. Alternative A involves reconstructing the runway 40 feet north of its present position. Alternative B involves reconstructing the parallel taxiway 40 feet south of its present position. A third option would be to request a modification to design standards. Pursuing the third option would require a detailed cost-benefit analysis of the

impacts of the other two options and an FAA airspace review before the FAA would issue a modification to standard. This detailed analysis is beyond the scope of this master plan, however, the following discusses the options for increasing the runway/taxiway separation distance to conform with FAA design standards.

An important consideration with either Alternative A or B are the imaginary surfaces surrounding the runway and taxiway which protect aircraft operational areas and keep them free from obstructions that could affect the safe operation of aircraft. These include the object free area (OFA), primary surface, and transitional surface. The OFA is defined as "a two dimensional ground area surrounding runways, taxiways, and taxilanes which is clear of objects except for objects whose location is fixed by function." The OFA surrounding the runway is 500 feet wide and extends 300 feet beyond each end of the runway. The object free area surrounding the taxiway is 131 feet wide.

The primary surface is an imaginary surface longitudinally centered on the runway which extends 200 feet beyond each runway end and is 500 feet wide. The primary surface must remain clear of objects to allow for the unobstructed passage of aircraft. The only exceptions are objects less than two feet high and those objects whose location is fixed by function. The transitional surface connects with the outside edge of the primary surface and rises at a slope of seven to one. There is not a restriction on objects within the transitional area, as long as they remain below the sloping surface. The runway object free area

ALTERNATIVE A

LEGEND

- Existing Property Line
- Ultimate Property Line
- Runway Extension to 4,700'
- Runway Extension to 5,500'
- Runway Protection Zone

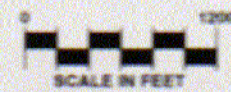


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ALTERNATIVE B

LEGEND

- Existing Property Line
- Ultimate Property Line
- Runway Extension to 4,700'
- Runway Extension to 5,500'
- Runway Protection Zone

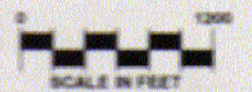


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ALTERNATIVE C

LEGEND

- Existing Property Line
- Ultimate Property Line
- Runway Extension to 4,700'
- Runway Extension to 5,500'
- Runway Protection Zone



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(ROFA), taxiway object free area (TOFA), primary surface, and a line marking a 25-foot clearance of the transitional surface are shown on **Exhibit 4B**.

As shown on **Exhibit 4B**, with the runway in its present position, the ROFA and primary surface (shown in magenta) are contained within the existing airport property line. Should the runway be reconstructed 40 feet north of its present positions (as shown in yellow on Alternative A), the ROFA and primary surface would extend 40 feet outside the existing property line. In the interest of aircraft safety, the City could and can maintain control of these areas with regard to acceptable land uses through several mechanisms such as overlay zones, ordinances, etc. Thus, reconstructing Runway 2-20 40 feet north of its present position would not necessarily require the City to acquire property along the north side of the Airport to ensure positive control over the ROFA and primary surface.

Alternative B, relocating the parallel taxiway 40 feet south of its present position, is shown in green on **Exhibit 4B**. Reconstructing the taxiway 40 feet south of its present position would displace all existing aircraft parking positions along the north edge of the apron as these aircraft parking positions would then be within the boundaries of the TOFA. Sufficient area is not available between the aircraft parking positions located in the center of the apron and the affected aircraft parking positions to relocate those aircraft parking positions outside the TOFA. Therefore, to meet long term demand, new aircraft parking positions would need to be constructed

to replace the displaced parking positions.

Presently, all of the transitional surface north of Runway 2-20, and portions of the transitional surface south of the runway are outside airport property. As can be interpreted from the aerial photo on **Exhibit 4B**, there are currently no objects which obstruct the transitional surface. However, without some form of control over the transitional surface, the City cannot prevent encroachment upon the transitional surface in the future. An encroachment upon the transitional surface could prevent the establishment of GPS approaches to the airport in the future. Therefore, it is recommended that the City of Eloy purchase the property adjacent to the airport to a 25-foot clearance of the transitional surface (425 feet from runway centerline) and enact a height and hazard zoning ordinance based upon Federal Aviation Regulations (FAR) Part 77 to protect the transitional surface at higher elevations. The acquisition of approximately 40.69 acres of land would be required to protect to a 25-foot clearance of the transitional surface on each side of the airport (shown in blue on **Exhibit 4B**).

Alternative A would be a viable alternative to increase the runway/taxiway separation distance should the City purchase property north of the airport to protect the transitional surface. Considering the age and present condition of the runway pavement surface and the loss of aircraft parking positions under Alternative B, it may be more appropriate to reconstruct the runway as shown in Alternative A to increase the runway/taxiway separation.

This could be accomplished concurrently with an extension of the runway.

LANDSIDE ALTERNATIVES

The primary landside facilities to be accommodated at the airport include airport-related businesses, aircraft storage and maintenance hangars, and an aircraft parking apron. The interrelationship of these functions is important to defining a long range landside layout for the airport. To a certain extent landside uses need to be grouped with similar uses or uses that are compatible. Other functions should be separated, or at least have well defined boundaries for reasons of safety, security, and efficient operation. Finally, each landside use must be planned in conjunction with the airfield, as well as ground access that is suitable to the function. Runway frontage should be reserved for those uses with a high level of airfield interface, or need for exposure. Other uses with lower levels of aircraft movements, or little need for runway exposure can be planned in more isolated locations.

The facility needs evaluation concluded that the existing apron area is sufficient to meet long term demands; however, a public terminal facility, paved parking areas, and additional T-hangar and larger conventional hangar areas for airport businesses are needed to accommodate forecast demand. The following briefly describes the requirements for each of these facilities.

Airport Businesses: This essentially relates to providing areas for the development of facilities associated with aviation businesses that require airfield access. This includes businesses involved with (but not limited to) aircraft rental and flight training, aircraft charters, aircraft maintenance, line service and aircraft fueling. Businesses such as these are characterized by high levels of activity with a need for apron space for the storage and circulation of aircraft. In addition, the facilities commonly associated with businesses such as these include large, conventional type hangars which hold several aircraft plus attached office and business space. Utility services are needed for these type of facilities as well as automobile parking areas.

T-Hangars: The facility requirements analysis indicated that an additional 18 T-hangar positions may be required to meet forecast demand. This additional hangar area would be required for the storage of smaller single and twin engine aircraft. Electrical service and conveniently located automobile parking areas are commonly needed for T-hangar facilities.

Terminal Building: General aviation terminal facilities have several functions including: providing space for passenger waiting, a pilot's lounge, flight planning, concessions, airport management, storage, and various other needs. Currently, there is not a dedicated airport terminal facility; however, flight planning, concessions, and restrooms are available

to the public on the east side of Hangar #5. Utility services are needed for these type of facilities as well as automobile parking areas.

Exhibit 4C illustrates two alternatives for maximizing existing airport property for future landside facility development. Alternative A extends taxiway access to a developable area between Tumbleweed Road and Lear Drive through an open area between Hangar 1 and Hangars 3, 4, and 5. As shown, an 8-unit T-hangar facility and as many as six single-aircraft storage hangars could be developed in the area. A terminal building and conventional hangar are shown for the open area between Hangars 1 and 2. Similar to Alternative A, Alternative B extends taxiway access to the developable area between Tumbleweed Road and Lear Drive. As shown, a 10-unit T-hangar facility and as many as five additional single-aircraft storage hangar facilities could be developed in the area. Similar to Alternative A, a future terminal building and conventional hangar are shown for the open area between Hangars 1 and 2. When compared with Alternative A, Alternative B provides more aircraft storage. A larger T-hangar facility and larger single-aircraft storage hangars can be developed in the area between Tumbleweed Road and Lear Drive.

Advantages: 1) Each alternative maximizes existing airport property for development. 2) Each alternative provides an area for the development of a public terminal building would could offer more amenities to travelers utilizing the Eloy Municipal Airport. 3) Each alternative provides an area along the apron for the development of a large

conventional hangar to support an aviation-related business (i.e. aircraft maintenance, aircraft charter). 4) Paved parking areas could be developed adjacent to each hangar facility.

Disadvantages: 1) Projected long term T-hangar aircraft storage demand cannot be accommodated in available area under either alternative. 2) Only small aircraft with wingspans less than 49 feet can be accommodated in the hangar development area between Tumbleweed Road and Lear Drive. 3) Limited access is available to Hangars 3, 4, and 5. 4) The areas shown for development are susceptible to flooding during heavy rains. An extensive storm water drainage system may be required to divert water from this area. This could increase hangar development costs.

Landside Alternative C is depicted on **Exhibit 4D**. This alternative proposes the purchase of approximately 4.1 acres of land adjacent to the newly-constructed taxiway for hangar development. As shown, this area can accommodate forecast T-hangar demand and a large conventional hangar, with areas for auto parking. Two conventional hangars are located along the existing apron frontage between Hangars 1 and 2. A public terminal building is located between Hangar 1 and Hangars 3, 4, and 5. A new entrance to existing hangar facilities is proposed from the Lear Drive/Tumbleweed Road intersection. An area for non-aviation related development could be available on either side of this new entrance road.

Advantages: 1) This alternative exceeds requirements for projected long term aircraft storage demand. 2) This

alternative provides an area for the development of a public terminal building which could offer more amenities to travelers utilizing the Eloy Municipal Airport. 3) This alternative provides an area along the apron and newly-constructed taxiway for the development of large conventional hangars to support aviation-related businesses (i.e. aircraft maintenance, aircraft charter). 4) Paved automobile parking areas are available adjacent to each hangar facility. 5) Non-aviation related lease parcels are available adjacent to the new airport entrance road which could enhance airport revenues. 6) This alternative utilizes an existing taxiway developed with City resources.

Disadvantages: 1) This alternative requires the purchase of approximately 4.1 acres of land for T-hangar expansion.

While not specifically shown in this alternative, or required for projected long term needs, the area for property purchase could be expanded to the southwest, as far as the existing property line. This offers several advantages, most importantly protecting the long range viability of the airport. Purchasing this property ensures positive control and a compatible land use. In addition, this area could offer additional revenue

enhancement possibilities for the airport fund through the lease of parcels of land for expanded general aviation services, and/or aviation and non-aviation related industrial development.

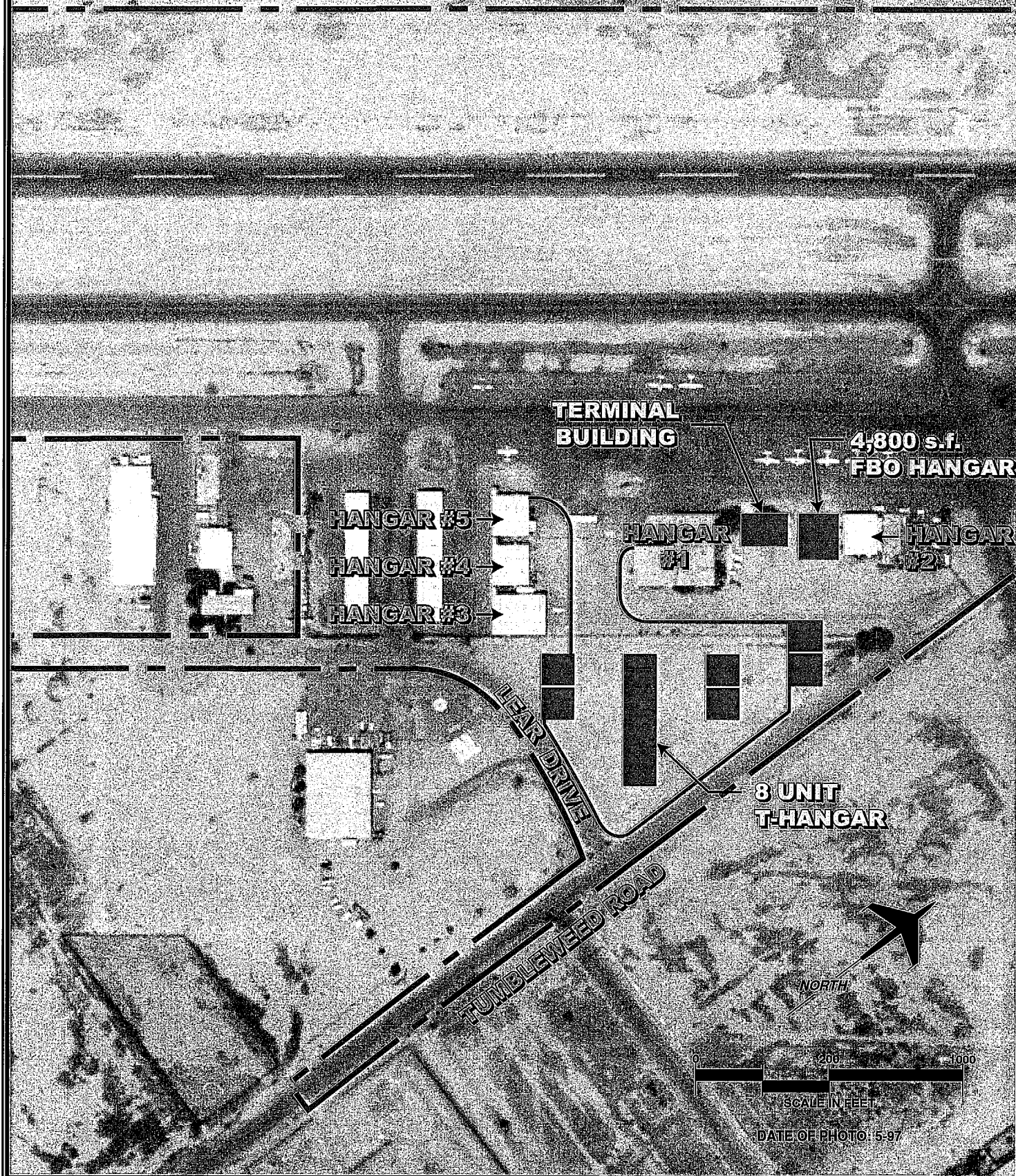
SUMMARY

The process utilized in assessing the airside and landside development alternatives involved a detailed analysis of short and long term requirements as well as future growth potential. Current airport design standards were considered at stage of development. The proposed development plan for the airport must represent a means by which the airport can grow in a balanced manner, both on the airside as well as the landside, to accommodate forecast demand. In addition, it must provide (as all good development plans should) for flexibility in the plan to meet activity growth beyond the 20-year planning period.

Upon review of the airport development alternatives working paper by City staff and the planning advisory committee, a final master plan concept will be formed. The remaining chapters will be dedicated to refining the basic concept into a final plan with recommendations to ensure proper implementation and timing for a demand-based program.

ALTERNATIVE A

EXISTING PROPERTY LINE



ALTERNATIVE B

EXISTING PROPERTY LINE

